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MYCOLOGY

RUSTS AND WOOD-ROTTING FUNGI ON SOME OF THE IMPORTANT INDIAN CONIFERS

BY

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FOREWORD

This paper gives a list of rusts and wood-rotting fungi occurring on some of the most important Indian coniferous trees and causing widespread damage to these timber species. It was considered that such a list may serve as a useful reference for research workers in timber technology, forest officers and timber men.

The results of the investigations on the biology of the Indian coniferous rusts have been collected from various publications and from records still in the process of compilation. The results of the investigations on the pathology of the Hymenomycetes and of the study of fungi causing decay are under compilation, and the data on these fungi have been collected from unpublished reports, and incorporated in the present list. Localities from which these organisms have been reported as also their respective habit and the type of rot caused by them, have been included.

K. BAGCHEE.

Rusts and Wood-rotting Fungi on some of the important Indian conifers.

Host.—*Abies pindrow* Spach.

I. Rusts—

(i) *Uredinopsis* sp. (on *Lastrea felix-mas* Linn.)

= *Peridermium* sp. on *Abies pindrow*.

Distribution.—North-western Himalayas.

(ii) *Peridermium thomsoni* Berk. & Cke.

Alternate stage.—Unmatched.

Distribution.—North-western Himalayas.

II. Wood-rotting Fungi—

(i) *Fomes annosus* (Fr.) Cke.—Spongy sap rot and brown root and butt rot.

Habit.—On living and dead trees.

Distribution.—Bashahr (Himachal Pradesh), Kulu (Punjab), Chakrata, Tehri Garhwal (Uttar Pradesh).

(ii) *Fomes pini* (Thore.) Lloyd.—red heart or pecky rot.

Habit.—On living trees.

Distribution.—Kulu (Punjab), Bashahr (Himachal Pradesh).

(iii) *Fomes pinicola* (Sw.) Cke.—brown crumbly rot.

Habit.—On wood.

Distribution.—North-western Himalayas—Kulu (Punjab), Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(iv) *Lenzites saeparia* (Wulf.) Fr.—the slash conk, brown cubical rot.

Habit.—On wood.

Distribution.—Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(v) *Lenzites subferruginea* Berk.—brown cubical rot.

Habit.—On wood.

Distribution.—Kulu (Punjab) and Chakrata (Uttar Pradesh).

(vi) *Merulius lacrymans* (Wulf.) Fr.—the dry rot fungus.

Habit.—On wood.

Distribution.—Kulu division (Punjab), Bashahr division (Himachal Pradesh).

(vii) *Polyporus sulphureus* (Bull.) Fr.—the sulphur fungus ; brown cubical rot.

Habit.—On living and dead trees.

Distribution.—Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(viii) *Polystictus abietinus* (Dicks.) Fr.—hollow sap rot.

Habit.—On wood.

Distribution.—Kulu division (Punjab), Bashahr division (Himachal Pradesh).

Host.—*Cedrus deodara* Loudon.

I. Rusts—

(i) *Peridermium cedri* (Barclay) Sacc.

Alternate stage.—Unmatched.

Distribution.—North-western Himalayas.

II. Wood-rotting Fungi—

(i) *Fomes annosus* (Fr.) Cke.—spongy sap rot and brown root and butt rot.

Habit.—On living trees.

Distribution.—Kulu (Punjab), Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(ii) *Fomes pini* (Thore.) Lloyd—red heart or pecky rot.

Habit.—On living trees.

(iii) *Lenzites saeparia* (Wulf.) Fr.—the slash conk ; brown cubical rot.

Habit.—On wood.

Distribution.—Kulu (Punjab) and Chakrata (Uttar Pradesh) divisions.

(iv) *Lenzites striata* Swartz.—brown cubical rot.

Habit.—On wood.

Distribution.—Chakrata division (Uttar Pradesh).

(v) *Lenzites subferruginea* Berk.—brown cubical rot.

Habit.—On wood.

Distribution.—Kulu (Punjab) and Chakrata (Uttar Pradesh) divisions.

(vi) *Polyporus circinatus* Fr.—red root and butt rot.

Habit.—On living trees.

Distribution.—Kulu (Punjab), Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(vii) *Polystictus abietinus* (Dicks.) Fr.—hollow sap rot.

Habit.—On wood.

Distribution.—Deoban, Mundali (Chakrata division, Uttar Pradesh).

Host.—*Picea morinda* Link.

I. Rusts—

(i) *Chrysomyxa deformans* (Diet.) Jaczew.—needle rust.

Alternate stage.—Unmatched.

Distribution.—North-western Himalayas.

(ii) *Chrysomyxa piceae* Barclay

Alternate stage.—Unmatched.

Distribution.—North-western Himalayas.

(iii) *Chrysomyxa himalensis* Barclay (on *Rhododendron arboreum* Sm.)

= *Peridermium piceae* (Barclay) Sacc. on *Picea morinda*.

Distribution.—North-western Himalayas.

(iv) *Peridermium thomsoni* Berk. & Cke.

Alternate stage.—Unmatched.

Distribution.—North-western Himalayas.

II. Wood-rotting Fungi—

(i) *Armillaria mellea* (Vahl.) Quel.—shoe-string fungus rot, rhizomorphic root rot.

Habit.—On living and dead trees.

Distribution.—Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(ii) *Fomes annosus* (Fr.) Cke.—spongy sap rot and brown root and butt rot.

Habit.—On living and dead trees.

Distribution.—Bashahr (Himachal Pradesh), Kulu (Punjab) and Chakrata (Uttar Pradesh) divisions.

(iii) *Fomes pini* (Thore.) Lloyd—red heart or pecky rot.

Habit.—On living trees.

Distribution.—Kulu (Punjab) and Bashahr (Himachal Pradesh) divisions.

(iv) *Fomes pinicola* (Sw.) Cke.—brown crumbly rot.

Habit.—On wood.

Distribution.—Simla (Punjab).

(v) *Lenzites subferruginea* Berk.—brown cubical rot.

Habit.—On wood.

Distribution.—Kulu (Punjab) and Chakrata (Uttar Pradesh) divisions.

(vi) *Merulius lacrymans* (Wulf.) Fr.—the dry rot fungus.

Habit.—On wood.

Distribution.—Kulu (Punjab) and Bashahr (Himachal Pradesh) divisions.

(vii) *Polyporus circinatus* Fr.—red root and butt rot.

Habit.—On living trees.

Distribution.—Deoban, Chakrata (Uttar Pradesh), Bashahr (Himachal Pradesh) divisions.

(viii) *Polyporus sulphureus* (Bull.) Fr.—the sulphur fungus; brown cubical rot.

Habit.—On living and dead trees.

Distribution.—Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(ix) *Polystictus abietinus* (Dicks.) Fr.—hollow sap rot.

Habit.—On wood.

Distribution.—Kulu (Punjab), Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

Host.—*Pinus excelsa* Wall.

I. Rusts—

X (i) *Cronartium ribicola* Fischer (on *Ribes rubrum* Linn. or *R. orientale* West.)

= *Peridermium strobi* Kleb.

= *Peridermium indicum* Colley & Taylor on *Pinus excelsa*—
a stem rust.

| *Distribution.*—Kulu (Punjab), Bashahr (Himachal Pradesh),
Chakrata (Uttar Pradesh) and Kashmir.

(ii) *Coleosporium barclayense* Bagchee (on *Senecio rufinervis* DC.)
 = *Peridermium brevius* (Barclay) Sacc. on *Pinus excelsa*—
 a needle rust.

Distribution.—Kulu (Punjab), Bashahr (Himachal Pradesh), Chakrata (Uttar Pradesh) and Kashmir.

(iii) *Melampsora oblonga* Bagchee—a needle rust.
Distribution.—Deoban, Chakrata division (Uttar Pradesh).

II. Wood-rotting Fungi—

(i) *Fomes annosus* (Fr.) Cke.—spongy sap rot and brown root and butt rot.

Habit.—On living trees.

Distribution.—Simla and Kulu divisions (Punjab), Bashahr (Himachal Pradesh).

(ii) *Fomes pini* (Thore.) Lloyd—red heart or pecky rot.

Habit.—On living trees.

Distribution.—Simla and Kulu divisions (Punjab), Bashahr (Himachal Pradesh).

(iii) *Fomes pinicola* (Sw.) Cke.—brown crumbly rot.

Habit.—On wood.

Distribution.—North-western Himalayas—Kulu (Punjab), Bashahr (Himachal Pradesh), Chakrata (Uttar Pradesh).

(iv) *Lenzites saeparia* (Wulf.) Fr.—the slash conk, brown cubical rot.

Habit.—On wood.

Distribution.—Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

The fungus is one of the most common destroyers of coniferous slash. It also causes extensive damage to exposed timber in service, e.g., poles, etc.

(v) *Lenzites subferruginea* Berk.—brown cubical rot.

Habit.—On wood.

Distribution.—Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

(vi) *Merulius lacrymans* (Wulf.) Fr.—the dry rot fungus.

Habit.—On wood.

Distribution.—Kulu (Punjab).

Tear fungus is “one of the most formidable of the tribe of fungi”.

(vii) *Polyporus circinatus* Fr.—red root and butt rot.

Habit.—On living trees.

Distribution.—North-west Himalayas.

(viii) *Polystictus abietinus* (Dicks.) Fr.—hollow sap rot.

Habit.—On wood.

Distribution.—Kulu (Punjab) and Chakrata (Uttar Pradesh) divisions.

(ix) *Poria rixosa* Karst.—white fibrous rot.

Habit.—On wood.

Distribution.—Kulu (Punjab), Bashahr (Himachal Pradesh).

Host.—*Pinus gerardiana* Wall.

I. Rusts.—Not recorded.

II. Wood-rotting Fungi—

(i) *Fomes pini* (Thore.) Lloyd—red heart or pecky rot.

Habit.—On living trees.

Distribution.—Upper recess of Sutlej valley beyond Nachar (Himachal Pradesh).

Host.—*Pinus insularis* Endl. (*P. khasya* Royle.)

I. Rusts—

(i) *Cronartium quercum* Berk. (on *Quercus griffithii* Hk. f. & Thom.)

= *Peridermium* sp. (*P. cerebrum* Peck.) on *Pinus insularis*.

Distribution.—Shillong range, Assam.

(ii) *Peridermium* sp.—a needle rust.

Alternate stage.—Unmatched.

Distribution.—Shillong range, Assam.

II. Wood-rotting Fungi—

(i) *Fomes pinicola* (Sw.) Cke.—brown crumbly rot.

Habit.—On living trees.

Distribution.—Assam.

(ii) *Lenzites saeparia* (Wulf.) Fr.—slash conk, brown cubical rot.

Habit.—On wood.

Distribution.—Assam.

(iii) *Lenzites subferruginea* Berk.—brown cubical rot.

Habit.—On wood.

Distribution.—Assam.

(iv) *Polyporus sulphureus* (Bull.) Fr.—the sulphur fungus; brown cubical rot.

Habit.—On living and dead trees.

Distribution.—Assam.

Host.—*Pinus longifolia* Roxb. (*P. roxburghii* Sargent)

I. Rusts—

(i) *Cronartium himalayense* Bagchee (on *Swertia angustifolia* (Buck.) Ham., *S. alata* Roxb., *S. cordata* Wall.)

= *Peridermium himalayense* Bagchee on *Pinus longifolia*—a stem rust.

Distribution.—Plantations near Almora, Ranikhet, Nainital, Pauri (Garhwal), Chakrata (Uttar Pradesh) and Simla (Punjab). The relationship between this rust and its alternate stage on *Swertia* spp. has been confirmed through inoculation experiments.

(ii) *Coleosporium campanulae* (Pers.) Lév. (on *Campanula colorata* Wall.)

= *Peridermium orientale* Cke. on *Pinus longifolia*—a needle rust.

Distribution.—Plantations near Almora, Ranikhet, Nainital, Pauri (Garhwal), Chakrata (Uttar Pradesh) and Simla (Punjab).

II. Wood-rotting Fungi—

(i) *Fomes annosus* (Fr.) Cke.—spongy sap rot and brown root and butt rot.

Habit.—On living trees.

Distribution.—Simla and Kulu divisions (Punjab), Bashahr (Himachal Pradesh).

The fungus is of world-wide distribution. Though a parasite on standing trees, it can continue to grow and slowly decay timber after it is felled, if the environments are damp.

(ii) *Fomes pini* (Thore.) Lloyd.—red heart or pecky rot.

Habit.—On living trees.

Distribution.—Simla and Kulu divisions (Punjab), Bashahr (Himachal Pradesh).

The rot caused by the fungus generally confines itself to the heartwood, only occasionally attacking living sapwood. The fungus has never been known to attack wood in service.

(iii) *Fomes pinicola* (Sw.) Cke.—brown crumbly rot.

Habit.—On wood.

Distribution.—North-western Himalayas—Kulu (Punjab), Bashahr (Himachal Pradesh) and Chakrata (Uttar Pradesh) divisions.

This fungus is one of the most common destroyers of dead coniferous timber and can be responsible for the rapid deterioration of timber killed by wind-throw, insects and other agencies.

(iv) *Lenzites striata* Swartz.—brown cubical rot.

Habit.—On wood.

Distribution.—Dehra Dun, Ranikhet (Uttar Pradesh) and Bengal.

(v) *Lenzites subferruginea* Berk.—brown cubical rot.

Habit.—On wood.

Distribution.—Almora (Uttar Pradesh).

(vi) *Polystictus abietinus* (Dicks.) Fr.—hollow sap rot.

Habit.—On wood.

Distribution.—Kulu (Punjab), Lansdowne (Uttar Pradesh).

The fungus appears to be purely saprophytic and does not spread into living sapwood. It however causes rapid decay in sapwood of felled timber.

(vii) *Poria monticola* Murr.—brown cubical rot.

Habit.—On living trees and wood in service.

Distribution.—Central and Western Himalayas.

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